



Research Paper

Socio-economic impact of zero - till wheat in Pratapgarh, district of U.P.

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ABSTRACT : The zero- till wheat has significant impact in Pratapgarh district of Uttar Pradesh where sowing of wheat invariably delayed by 15 to 20 days resulting in reduction in yield can be avoided through ZT, due to 10-15 days earlier sowing than conventional method of wheat sowing, these findings are close conformity with findings of Sinha and Singh (2005). During study year 2013-14 it was observed that, on average the same crop yields are possible by zero-tillage compared to conventional tillage. The survey of 200 randomly selected zero tillage adopters and non-adopters has clearly established socio-cultural, psychological and economic gains by reflecting average grain production of zero-tillage 34.75 qt and conventional tillage 33.11 qt/ha. The percentage increase in wheat (grain) yield of zero-tillage over conventional tillage 4.95 per cent. The average yield of straw was recorded zero-tillage-37.65qt/ha and conventional 39.50 qt/ha which was 4.90 per cent less than conventional method and comparatively more economical technique in rice-wheat cropping system similar findings of Muhammad *et al.* (2011), crucial incentive for resource poor farmers. Further, the scanning of socio-economic data indicated that ZT technology had sense of achievement, merit for promotion, technical feasibility, stress reduction and opportunity for custom hiring services.

KEY WORDS: Zero-tillage, Conventional tillage, Socio-economic, Wheat

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INTRODUCTION :

Pratapgarh is economically one of the under developed district of Uttar Pradesh. Lies in central plain Agro climatic zone. The district comprises five tehsils and divided into 17. Development blocks, about 93 per cent population of the district is involved in Agriculture and allied field operations. In district Pratapgarh mainly rice-wheat cropping system is followed and in *Rabi* season approximately in 88 per cent area wheat is grown. Socio-economic impact of ZT technology among adopters and non-adopters was studied in those clusters where

farmers had adopted this innovative technology. In the rice – wheat area farmer prefer to grow MTU-7029 late and high yielding variety of rice because of seepage area due to canal irrigation and late harvesting, ultimately causes delay in wheat sowing results significant loss in yield. To avoiding late sowing of wheat, zero tillage technology is being introduced in rice-wheat system. The main objectives of the study were to analyze the socio-economic impact of ZT technology on operational requirements time of sowing yield, profitability and econometric analysis of zero tillage versus conventional method of wheat sowing.

Objective :

The objective of the study :

–To evaluate the socio-economic status of zero-tillage adopters.

–To assess savings through zero-tillage over conventional method.

MATERIALS AND METHODS :

A detailed field survey was conducted to determine and compare the socio-economic impact of zero tillage and conventional method of wheat cultivation. The structured and pre-tested questionnaires were used for the survey. The survey was conducted in district Pratapgarh U.P. 04 (four) representative blocks namely- Kalakankar, Rampur Sangramgarh, Sangipur and Sandawa Chandika and 02 (two) representative villages from each block were selected, out of total 08 villages 25 respondent from each village, under 03 sub category marginal-15, small-05, and large-05, out of total 200 farmers 100 - Adopter and 100 non-adopter respondent were interviewed. Keeping in view the objectives of the study and the nature of elementary units of study population, the respondents included for interview were those farmers who have been using both the techniques *i.e.* zero tillage and conventional methods for sowing of wheat.

RESULTS AND DATA ANALYSIS :

The data recorded in Table 1 indicate that out of 100 farmer in each category- adopter and non - adopter, the highest number of 60 farmers (60%) belonged to marginal size of holding followed by 20 per cent farmers belonged to small and 20 per cent medium/large categories, respectively, maximum number of sample farmers from adopter and non- adopter were taken because of small size of holdings.

Table 1 : Operational size of holdings

Category and size of holdings	Adopters (%)	Non-adopters (%)
Marginal- below – 1.0ha	60	60
Small 1.1- 2.0 ha	20	20
Medium/large (Above 2.0 ha)	20	20
Total	100	100

The age-wise distribution of sample farmers showed that maximum adopters were in age group of above 50

years followed by upto 40 years of age group (Table 2). which reflects that mature and younger farmers of the society are fast adopter and better decision makers in favour of innovative technology. Most of them belong to

Table 2 : Age of respondents

Age groups	Adopters (%)	Non-adopters (%)
Upto 40 yrs.	34	40
	Medium large	Medium large
40-50 yrs.	30	31
	4	2
	4	4
Above 50 yrs.	36	29
	8	12
	16	8
Total	100	100

Table 3 : Type of family

Type	Adopters (%)	Non-adopters (%)
Joint	51	31
	8	14
	20	12
Nuclear	49	69
	24	28
	40	
Total	100	100
	32	40
	60	40

Table 4 : Type of house possessed

Type	Adopters (%)	Non-adopters (%)
Kuccha	23	33
	8	14
	20	12
Pucca	70	64
	24	28
	40	
Mixed	07	03
	32	40
	60	40

Table 5 : Education level

Education	Adopters (%)	Non-adopters (%)
Upto middle	25	41
Upto intermediate	45	48
Graduate and above	30	11
Total	100	100

Table 6 : Affiliation to social organizations		
Membership	Adopters (%)	Non-adopters (%)
Panchayat	8	5
	—	2
	4	—
Co-operative	12	15
	8 *	10 +
	16 **	14++
Social/relegion	16	10
commetee	8 *	12 +
	40 **	22++
None	64	70
	16	16
	—	4
Total	100	100
	32	40
	60	40

joint families (51%) because risk bearing capacity is comparatively more (Table 3) and (70%) adopters possessed pucca house (Table 4) and have education level of intermediate (40%) followed by graduate and above (30%) in (Table 5). The higher score on institutional membership like bank and co-operative revealed that zero tillage technology had been adopted by farmers respective to their status in the society (Table 6).

Table 7 shows that 11 per cent adopter farmers having own tractor, 9 per cent with thresher, 2 per cent having ZT drill and 76 per cent adopter having own pumpset. In case of rotavator non-adopter having 12 per cent and adopter with 10 per cent only. The material possession like TV, Refrigerator, washing machine, scooter/motorcycle and car / jeep are more with adopters but number of cycle and transistor are higher with non-adopters (Table 8).

The Table 9 showed that zero tillage cost/ha Rs. 18741.00 and cost of conventional tillage Rs. 23675.00

Table 7 : Farm implements			
Sr. No.	Implements	Adopters (%)	Non-adopters (%)
1.	Tractor	11	08
		8	10
		38	18
2.	Trolley	11	08
		8	8
		38	18
3.	Thresher	09	06
		14	18
		48	28
4.	Seed drill	—	03
		4	8
		6	10
5.	ZT drill	02	-
		14	—
		—	—
6.	Rotavator	10	12
		—	—
		2	—
7.	Pump set (Diesel)	76	72
		2	—
		—	—
8.	Electric tube-well	12	10
		—	—
		—	—
9.	Power sprayer	13	08
		30	28
		60	40

Table 8 : Materials possession

Sr. No.	Items	Adopters (%)	Non-adopters (%)
1.	Radio/transistor	64	80
		10	16
		4	10
2.	Television	100	96
		4	12
		8	10
3.	Refrigerator	44	36
		2	8
		14	12
4.	Washing machine	36	20
		–	–
		2	2
5.	Telephone/Mobile	100	100
		–	–
		4	2
6.	Cycle	56	80
		32	18
		40	22
7.	MC/scooter	88	72
		6	4
		10	18
8.	Car/jeep	32	28
		–	–
		2	2

Table 9 : Input cost saving head wise -zero tillage over conventional tillage

Sr. No.	Input	Zero tillage cost/ha	Conventional tillage cost/ha	Net saving/ha (Rs.)
1.	Tractor charges	1890.00	4189.00	2299.00
2.	Labour	300.00	600.00	300.00
3.	Seed cost	3078.00	4131.00	1053.00
4.	Irrigation charges	6902.00	8848.00	1946.00
5.	Weed control	998.00	996.00	-2.00
6.	Fertilizer cost	5573.00	4911.00	-662.00
	Grand total	18741.00	23675.00	4934.00

Table 10 : Average output /yield /ha

Yield/ha	Zero tillage		Conventional tillage		Net saving over CT (Rs.)
	Qty.(Qt)	Amt. (Rs.)	Qty (Qt.)	Amt (Rs.)	
Grain production	34.75	52125.00	33.11	49665.00	2460.00
Straw production	37.65	11295.00	39.50	11850.00	-555.00
Grand total	--	63420.00	--	61515.00	1905.00

and charges of different inputs like-tractor, labour, seed and irrigation saving in cost of production in (ZT) over (CT) also reported by Malik *et al.* (2005) higher in case of conventional tillage over zero-tillage (ZT) and weed control charges are almost same in both zero-tillage Rs. 998/ha and conventional tillage Rs. 996/ha. Fertilizer cost of zero-tillage Rs. 5573.00 and conventional tillage Rs. 4911.00 /ha, less with conventional method. ZT reduces input cost these findings are close confirmity to the findings of Singh and Meena (2013) , saving through zero-tillage Rs. 4934.00/ ha over conventional tillage.

The Table 10 showed that Av. output/yield of zero-tillage wheat (grain) 34.75 qt/ha of value Rs. 52125.00 and conventional tillage 33.11qt/ha of Rs. 49665.00 that is 4.95 per cent higher than conventional tillage. Similar results were reprinted by Thakur (2005) in Uttaranchal and Singh *et al.* (2005), in eastern U. P. and Mrabet *et al.* (2004). In case of straw production zero-tillage 37.65 qt./ha of Rs. 11295.00 and conventional tillage 39.50 qt/ha of Rs. 11850.00 that is 4.90 per cent higher than zero-tillage, saving through output/yield in zero-tillage over conventional tillage is Rs.1905.00 per ha.saving in zero-tillage in comparison to conventional tillage method of wheat Rs. 6839.00/ha, overall savings resulted social upliftment of zero-tillage adopters.

Conclusion :

The study tested the hypothesis that zero tillage (ZT) based wheat production provide adequate socio- economic benefits to farmers compared to the conventional tillage (CT). Finally on the basis of study results, we may draw the conclusion that zero-tillage wheat can be promoted in rice-wheat cropping area of Pratapgarh specially where late varieties of paddy is grown. This may be used as reference for future research work.

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LITERATURE CITED :

- Malik, R.K., Yadav, Ashok, Gupta, R. K., Singh, Samar, Hobbs, P. R. and Bellinder, R. (2005). Introduction and success of zero-tillage in wheat under rice-wheat cropping system in Haryana, India – related stories. Project workshop proc. on “Accelerating the adoption of resource conservation technologies in rice-wheat systems of the indo-gangetic plains” held on June 1-2, 2005 at Hisar (Haryana), India. pp. 1-17.
- Mrabet, R., El-Brahli, A., Anibat, I. and Bessam, F. (2004) . No-tillage technology: Research review of impacts on soil quality and wheat production in semiarid morocco, Institut National de la Recherche Agronomique (INRA), P.O. Box 589, 26000 Settat, Morocco, *Mediterranean rainfed agriculture: Strategies for sustainability* Zaragoza : CIHEAM, 2004. p. 133- 138.
- Muhammad, Husnain, Bukhsh, M.A.H.A., Javid, Iqbal, Tasneem, Khaliq and Shahid, Ibne Zamir (2011). Agro-economic response of two wheat varieties under different tillage practices Department of Agronomy, University of Agriculture, Faisalabad, Pakistan’2Agriculture Adaptive Research Complex, Dera Ghazi Khan, Pakistan,3 Department of Agronomy, College of Agriculture, Dera Ghazi Khan, Pakistan, *Crop & Environment*, 2(2): 1-7.
- Singh, C.M., Pandey, R.V. and Singh, Janmejai (2005). Accelerating of zero-tillage technology in indo-gangetic plains of eastern Uttar Pradesh. Project workshop proc. on “Accelerating the adoption of resource conservation technologies in rice-wheat systems of the indo-gangetic plains” held on June 1-2, 2005 at Hisar (Haryana), India. pp. 148-153.
- Singh, K.M. and Meena, M.S. (2013). Economics of conservation agriculture: An Overview ICAR-RCER, Patna, Zonal Project Directorate, Jodhpur, India 17. August 2013; MPRA Paper No. 49381, posted 30. August 2013 13:50 UTC.
- Sinha R.K. and Singh, A. K. (2005). Impact assessment of zero tillage in wheat, Agricultural Research Institute, Lohianagar, Patna-800 020 Institute, . Project workshop proc. on “Accelerating the adoption of resource conservation technologies in rice-wheat systems of the indo-gangetic plains” held on June 1-2, 2005 at Hisar (Haryana), India. pp.67-73.
- Thakur, T. C. (2005). Zero-tillage in wheat after rice in the state of Uttaranchal. Project workshop proc. on “Accelerating the adoption of resource conservation technologies in rice-wheat systems of the indo- gangetic plains”. held on June 1-2, 2005, pp. 160-164 at Hisar (HARYANA) INDIA.